

**RULES  
OF  
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION  
TENNESSEE WATER QUALITY CONTROL BOARD  
DIVISION OF WATER POLLUTION CONTROL**

**CHAPTER 1200-4-3  
GENERAL WATER QUALITY CRITERIA**

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**1200-4-3-.01 TENNESSEE WATER QUALITY CONTROL BOARD.**

The Water Quality Control Act, T.C.A., §69-3-101, et seq., makes it the duty of the Water Quality Control Board to study and investigate all problems concerned with the pollution of the Waters of the State and with its prevention, abatement, and control; and to establish such standards of quality for any Waters of the State in relation to their reasonable and necessary use as the Board shall deem to be in the public interest; and establish general policies relating to pollution as the Board shall deem necessary to accomplish the purposes of the Act. The following general considerations and criteria shall be used to determine the permissible conditions of waters with respect to pollution and preventative or corrective measures required to control pollution in various waters or in different sections of the same waters.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999. Amendment filed October 24, 2003; effective January 7, 2004.

**1200-4-3-.02 GENERAL CONSIDERATIONS.**

- (1) Tennessee water quality standards shall consist of the General Water Quality Criteria and the Antidegradation Statement found in Rule 1200-4-3, and the Use Classifications for Surface Waters found in Rule 1200-4-4.
- (2) Waters have many uses which in the public interest are reasonable and necessary. Such uses include: sources of water supply for domestic and industrial purposes; propagation and maintenance of fish and other aquatic life; recreation in and on the waters including the safe consumption of fish and shellfish; livestock watering and irrigation; navigation; generation of power; propagation and maintenance of wildlife; and the enjoyment of scenic and aesthetic qualities of waters.
- (3) The rigid application of uniform water quality is not desirable or reasonable because of the varying uses of such waters. The assimilative capacity of a stream for sewage and waste varies depending upon various factors and including the following: volume of flow, depth of channel, the presence of falls or rapids, rate of flow, temperature, natural characteristics, and the nature of the stream. ~~Also, the relative importance assigned to each use will differ for different waters and sections of waters.~~
- (4) In order to permit the reasonable and necessary uses of the Waters of the State, existing pollution should be corrected as rapidly as practicable, and future pollution prevented through the best available

(Rule 1200-4-3-.02, continued)

technology economically achievable or that greater level of technology necessary to meet water quality standards; i.e., modeling and stream survey assessments, treatment plants or other control measures.

- (5) Since all Waters of the State are classified for more than one use, the most stringent criteria will be applicable. In cases where criteria for protection of more than one use apply at different stream flows (e.g., aquatic life versus recreation), the most protective stringent criteria will also be applicable.
- (6) Waters identified as wet weather conveyances according to the definition found in 1200-4-3-.04 (4), shall be protective of humans and wildlife that may come in contact with them and shall not ~~degrade or~~ adversely affect the quality of downstream waters. Applicable water quality standards will be maintained downstream of wet weather conveyances.
- (7) Some general water quality criteria will be applied on a regional, ecoregional, or subcoregional basis. These criteria will be considered to apply to a stream if eighty percent of its watershed or catchment is contained within the unit upon which the criterion is based. Wadeable streams are those that can be sampled using a hand held, one meter square kick net without water and materials escaping over the top of the net. References for wadeable stream sampling techniques include, but are not limited to: the department's current Quality System Standard Operating Procedure for Macroinvertebrate Stream Surveys.
- ~~(8)~~—All fish and aquatic life metals criteria are expressed as total recoverable, except cadmium, copper, lead, nickel, silver, and zinc which are expressed as dissolved. Translators will be used to convert the dissolved fraction into a total recoverable permit limit. One of three approaches to metals translation will be used: (1) translator is the same as the conversion factor, (2) translator is based on relationships derived from STORET data, (3) a site-specific translator is developed. Where available, a site-specific translator is preferred. For assessing whether criteria for cadmium, copper, lead, nickel, silver, and zinc are exceeded by ambient water quality conditions, the dissolved criteria will also be translated in order to allow direct comparison to the ambient data, if total recoverable.
- (9) Site-specific criteria studies may be conducted on any appropriate fish and aquatic life criteria.
  - a. Site-specific criteria studies based on a Water Effects Ratio (WER) may supersede the adopted criteria at a site. ~~be conducted on any appropriate fish and aquatic life criteria. When the Division develops or approves site-specific criteria, a~~The Water Effects Ratio (WER) methodology study which is based on the calculated toxicity of a parameter substance in the stream to in which it will be introduced. ~~for any substances for which generally applicable criteria have been adopted, the site-specific criteria will supersede the adopted criteria at that location. ecific criteria developed by others provided that an appropriate methodology is used and that both the study plan and results are approved.~~ The Division can approve a site-specific criteria developed by others provided that the WER methodology [Interim Guidance on Determination and Use of Water-effect Ratios for Metals (EPA-823-B-94-001)] is used, both the study plan and results are approved by the department, and the U.S. Environmental Protection Agency has concurred with the final site specific criterion value(s).
  - b. Any site specific criterion based on methodologies other than the WER methodology which recalculate specific criterion, such as the Resident Species Method or the Recalculation Method, must be adopted as a revision to Tennessee water quality standards into Chapter 1200-4-3, and following EPA approval, can be used for Clean Water Act purposes.

References on this subject include, but are not limited to: Technical Support Document for Water Quality-based Toxics Control (EPA - 505/2-90-001); Technical Guidance Manual for Performing Waste Load Allocations: Book VIII (EPA/600/6-85/002a/002b/002c); MinteqA2, An Equilibrium Metal Speciation Model (EPA/600/3-87/012); Water Quality Standards Handbook, Second Edition

(Rule 1200-4-3-.02, continued)

(EPA-823-B-93-002); The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit From a Dissolved Criteria (EPA-823-B-96-007), Interim Guidance on Determination and Use of Water-effect Ratios for Metals (EPA-823-B-94-001).

(10.9) Interpretation and application of narrative criteria shall be based on available scientific literature and EPA guidance and regulations.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999. Amendment filed October 24, 2003; effective January 7, 2004.

### 1200-4-3-.03 CRITERIA FOR WATER USES.

(1) Domestic Water Supply.

- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
- (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
- (c) Hardness or Mineral Compounds - The hardness of or the mineral compounds contained in the water shall not appreciably impair the usefulness of the water as a source of domestic water supply.
- (d) Total Dissolved Solids - The total dissolved solids shall at no time exceed 500 mg/l.
- (e) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character as may impair the usefulness of the water as a source of domestic water supply.
- (f) Turbidity or Color - There shall be no turbidity or color in amounts or characteristics that cannot be reduced to acceptable concentrations by conventional water treatment processes (See definition).
- (g) Temperature - The maximum water temperature change shall not exceed 3C° relative to an upstream control point. The temperature of the water shall not exceed 30.5°C and the maximum rate of change shall not exceed 2C° per hour. The temperature of impoundments where stratification occurs will be measured at a depth of 5 feet or mid-depth, whichever is less, and the temperature in flowing streams shall be measured at mid-depth.
- (h) Coliform - The concentration of the E. coli group shall not exceed 630 per 100 ml- as a geometric mean based on a minimum of 5 samples collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. For the purpose of determining the geometric mean, individual samples having an E. coli group concentration of less than 1 per 100 ml shall be considered as having a concentration of 1 per 100 ml.
- (i) Taste or Odor - The waters shall not contain substances which will result in taste or odor that prevent the production of potable water by conventional water treatment processes.

(Rule 1200-4-3-.03, continued)

- (j) Toxic Substances - The waters shall not contain toxic substances, whether alone or in combination with other substances, which will produce toxic conditions that materially affect the health and safety of man or animals, or impair the safety of conventionally treated water supplies. Available references include, but are not limited to: Quality Criteria for Water (Section 304(a) of Public Law 92-500 as amended); Federal Regulations under Section 307 of Public Law 92-500 as amended; and Federal Regulations under Section 1412 of the Public Health Service Act as amended by the Safe Drinking Water Act, (Public Law 93-523). Limits set for some of the most commonly occurring toxic substances are as follows:

Compound	Criteria (ug/L)	Compound	Criteria (ug/L)
Antimony	6	Diquat	20
Arsenic	10	Endothall	100
Beryllium	4	Glyphosate	700
Barium	2000	Hexachlorobenzene	1
Cadmium	5	Hexachlorocyclopentadiene	50
Chromium, total	100	Oxamyl (Vydate)	200
Lead	5	Picloram	500
Cyanide (as free cyanide)	200	Simazine	4
Mercury	2	2,3,7,8 TCDD (Dioxin)	0.00003
Nickel	100	Benzene	5
Compound	Criteria (ug/L)	Compound	Criteria (ug/L)
Selenium	50	Carbon tetrachloride	5
Thallium	2	1,2-Dichloroethane	5
Alachlor	2	1,1-Dichloroethylene	7
Atrazine	3	1,1,1-Trichloroethane	200
Carbofuran	40	Trichloroethylene	5
Chlordane	2	Vinyl chloride	2
Dibromo chloropropane	0.2	para-Dichlorobenzene	75
2,4 Dichlorophenoxyacetic	70	cis 1,2-Dichloroethylene	70
Ethylene dibromide	0.05	1,2-Dichloropropane	5
Heptachlor	0.4	Ethyl benzene	700
Heptachlor epoxide	0.2	Monochlorobenzene	100
Lindane	0.2	ortho-Dichlorobenzene	600
Methoxychlor	40	Styrene	100
Polychlorinated biphenyls	0.5	Tetrachloroethylene	5
2,4,5 Trichlorophenoxy xyriponic acid	50	Toluene	1000
Pentachlorophenol	1	trans 1,2-Dichloroethylene	100
Benzo(a)pyrene	0.2	Xylenes, total	10000
Dalapon	200	Dichloromethane	5
Di(2-ethylhexyl) adipate	400	1,2,4-Trichlorobenzene	70
Di(2-ethylhexyl) phthalate	6	1,1,2-Trichloroethane	5
Dinoseb	7	Endrin	2.0
		Toxaphene	3

(Rule 1200-4-3-.03, continued)

- (k) Other Pollutants - The waters shall not contain other pollutants in quantities that may be detrimental to public health or impair the usefulness of the water as a source of domestic water supply.
- (2) Industrial Water Supply.
- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
  - (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
  - (c) Hardness or Mineral Compounds - The hardness of or the mineral compounds contained in the water shall not appreciably impair the usefulness of the water as a source of industrial water supply.
  - (d) Total Dissolved Solids - The total dissolved solids shall at no time exceed 500 mg/l.
  - (e) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character as may impair the usefulness of the water as a source of industrial water supply.
  - (f) Turbidity or Color - There shall be no turbidity or color in amounts or characteristics that cannot be reduced to acceptable concentrations by conventional water treatment processes.
  - (g) Temperature - The maximum water temperature change shall not exceed 3C° relative to an upstream control point. The temperature of the water shall not exceed 30.5°C and the maximum rate of change shall not exceed 2C° per hour. The temperature of impoundments where stratification occurs will be measured at a depth of 5 feet or mid- depth, whichever is less, and the temperature in flowing streams shall be measured at mid-depth.
  - (h) Taste or Odor - The waters shall not contain substances which will result in taste or odor that would prevent the use of the water for industrial processing.
  - (i) Toxic Substances - The waters shall not contain toxic substances whether alone or in combination with other substances, which will adversely affect industrial processing.
  - (j) Other Pollutants - The waters shall not contain other pollutants in quantities that may adversely affect the water for industrial processing.
- (3) Fish and Aquatic Life.
- (a) Dissolved Oxygen - The dissolved oxygen shall not be less than 5.0 mg/l with the following exceptions.
    - 1. In streams identified as trout streams, including tailwaters, dissolved oxygen shall not be less than 6 mg/L.
    - 2. The dissolved oxygen concentration of trout waters designated as supporting a naturally reproducing population shall not be less than 8.0 mg/L. (Tributaries to trout streams or

(Rule 1200-4-3-.03, continued)

naturally reproducing trout streams should be considered to be trout streams or naturally reproducing trout streams, unless demonstrated otherwise. Additionally, all streams within the Great Smoky Mountains National Park should be considered naturally reproducing trout streams.)

3. In wadeable streams in subecoregion 73a ~~and subecoregion 74i~~, dissolved oxygen levels shall ~~not be sufficient to maintain a diverse biological community. less than a daily average of 5 mg/L with a minimum dissolved oxygen level of 4 mg/L.~~

4. The dissolved oxygen level of streams in ecoregion 66 (Blue Ridge Mountains) not designated as naturally reproducing trout streams shall not be less than 7.0 mg/L.

Substantial and/or frequent variations in dissolved oxygen levels, including diurnal fluctuations, are undesirable if caused by man-induced conditions. Diurnal fluctuations shall not be substantially different than the fluctuations noted in reference streams in that region.

In lakes and reservoirs, the dissolved oxygen concentrations shall be measured at mid-depth in waters having a total depth of ten feet or less, and at a depth of five feet in waters having a total depth of greater than ten feet and shall not be less than 5.0 mg/L.

- (b) pH - The pH value shall not fluctuate more than 1.0 unit over a period of 24 hours and shall not be outside the following ranges: 6.0 – 9.0 in wadeable streams and 6.5 – 9.0 in larger rivers, lakes, reservoirs, and wetlands.

Subecoregion	Stream Order	pH Range
<del>68a</del>	<del>1–3</del>	<del>5.5–8.0</del>
<del>68a</del>	<del>4+</del>	<del>6.0–9.0</del>
<del>65j</del>	<del>1–2</del>	<del>5.5–8.5</del>
<del>65j</del>	<del>3+</del>	<del>6.0–9.0</del>
<del>74b</del>	<del>All</del>	<del>5.5–8.5</del>
<del>All other wadeable streams</del>		<del>6.0–9.0</del>
<del>All other waters (larger rivers, reservoirs, wetlands)</del>		<del>6.5–9.0</del>

- (c) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to fish and aquatic life.
- (d) Turbidity, Total Suspended Solids, or Color - There shall be no turbidity, total suspended solids, or color in such amounts or of such character that will materially affect fish and aquatic life. In wadeable streams, suspended solid levels over time should not be substantially different than conditions found in reference streams.
- (e) Temperature - The maximum water temperature change shall not exceed 3C° relative to an upstream control point. The temperature of the water shall not exceed 30.5°C and the maximum rate of change shall not exceed 2C° per hour. The temperature of recognized trout waters shall not exceed 20°C. There shall be no abnormal temperature changes that may affect aquatic life unless caused by natural conditions. The temperature in flowing streams shall be measured at mid-depth.

The temperature of impoundments where stratification occurs will be measured at mid-depth in

(Rule 1200-4-3-.03, continued)

the epilimnion (see definition) for warm water fisheries and mid-depth in the hypolimnion (see definition) for cold water fisheries. In the case of large impoundments (100 acres or larger) subject to stratification and recognized as trout waters, the temperature of the hypolimnion shall not exceed 20°C. ~~The temperature in flowing streams shall be measured at mid-depth.~~

- (f) Taste or Odor - The waters shall not contain substances that will impart unpalatable flavor to fish or result in noticeable offensive odors in the vicinity of the water or otherwise interfere with fish or aquatic life. References include, but are not limited to: Quality Criteria for Water (section 304(a) of Public Law 92-500 as amended).
- (g) Toxic Substances - The waters shall not contain substances or a combination of substances including disease - causing agents which, by way of either direct exposure or indirect exposure through food chains, may cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), physical deformations, or restrict or impair growth in fish or aquatic life or their offspring. References on this subject include, but are not limited to: Quality Criteria for Water (Section 304(a) of Public Law 92-500 as amended); Federal Regulations under Section 307 of Public Law 92-500 as amended. The following criteria are for the protection of fish and aquatic life:

Compound	Criterion Maximum Concentration ug/l (CMC)	Criterion Continuous Concentration ug/l (CCC)
Arsenic (III)*	340	150
Cadmium**	2.0	0.25
<del>Chromium, total</del>	<del>---</del>	<del>100</del>
<u>Chromium, III**</u>	<u>570</u>	<u>74</u>
Chromium, VI*	16	11
Copper**	13	9.0
<u>Iron</u>		<u>1000.0</u>
Lead**	65	2.5
Mercury*	1.4	0.77
Nickel**	470	52
Selenium	20	5
Silver**	3.2	---
Zinc**	120	120
Cyanide***	22	5.2
Chlorine (TRC)	19	11
Pentachlorophenol****	19	15
Aldrin	3.0	---
g-BHC <del>---</del> Lindane	<del>2.0</del> <u>0.95</u>	<del>0.08</del> <u>---</u>
Chlordane	2.4	0.0043
Compound	Criterion Maximum Concentration ug/l (CMC)	Criterion Continuous Concentration ug/l (CCC)
4-4'-DDT	1.1	0.001
Dieldrin	0.24	0.056
a-Endosulfan	0.22	0.056
b-Endosulfan	0.22	0.056
Endrin	0.086	0.036
Heptachlor	0.52	0.0038
Heptachlor epoxide	0.52	0.0038
PCBs, <u>total each arachlor</u>	---	0.014

(Rule 1200-4-3-.03, continued)

Toxaphene	0.73	0.0002
<u>Tributyltin (TBT)</u>	<u>0.46</u>	<u>0.072</u>

\* Criteria for these metals are expressed as dissolved.

\*\* Criteria for these metals are expressed as dissolved and are a function of total hardness (mg/L). Hardness-dependent metals criteria may be calculated from the following (values displayed above correspond to a total hardness of 100 mg/l and may have been rounded):

$$\text{CMC (dissolved)} = \exp\{m_A[\ln(\text{hardness})] + b_A\} \text{ (CF)}$$

$$\text{CCC (dissolved)} = \exp\{m_C[\ln(\text{hardness})] + b_C\} \text{ (CF)}$$

Chemical	M <sub>A</sub>	b <sub>A</sub>	M <sub>C</sub>	B <sub>C</sub>	Freshwater Conversion Factors (CF)	
					CMC	CCC
Cadmium	1.0166	-3.924	0.7409	-4.719	1.136672-[(ln hardness)(0.041838)]	1.101672-[(ln hardness)(0.041838)]
<u>Chromium III</u>	<u>0.8190</u>	<u>3.7256</u>	<u>0.8190</u>	<u>0.6848</u>	<u>0.316</u>	<u>0.860</u>
Copper	0.9422	-1.700	0.8545	-1.702	0.960	0.960
Lead	1.273	-1.460	1.273	-4.705	1.46203-[(ln hardness)(0.145712)]	1.46203-[(ln hardness)(0.145712)]
Nickel	0.8460	2.255	0.8460	0.0584	0.998	0.997
Silver	1.72	-6.59			0.85	
Zinc	0.8473	0.884	0.8473	0.884	0.978	0.986

If criteria are hardness-dependent, the Criterion Maximum Concentration (CMC) and Criterion Continuous Concentration (CCC) shall be based on the actual stream hardness. When an ambient hardness of less than 25 mg/l is used to establish criteria for cadmium or lead, the hardness dependent conversion factor (CF) shall not exceed one. When ambient hardness is greater than 400 mg/l, criteria shall be calculated according to one of the following two options: (1) calculate the criterion using a default Water Effects Ratio (WER) of 1.0 and a hardness of 400 mg/l in the hardness based equation; or (2) calculate the criterion using a WER and the actual ambient hardness of the surface water in the hardness based equation. For information concerning metals translation and site-specific criteria, see 1200-4-3-.02 (9).

\*\*\* — If Standard Methods 4500-CN I (Weak Acid Dissociable), 4500-CN G (Cyanides Amenable to Chlorination after Distillation), or OIA-1677 are used, this criterion may be applied as free cyanide.

\*\*\* — Criteria for pentachlorophenol are expressed as a function of pH. Values displayed above correspond to a pH of 7.8 and are calculated as follows:

$$\text{CMC} = \exp(1.005(\text{pH}) - 4.869) \quad \text{CCC} = \exp(1.005(\text{pH}) - 5.134)$$



(Rule 1200-4-3-.03, continued)

- (h) Other Pollutants - The waters shall not contain other pollutants that will be detrimental to fish or aquatic life.

- (i) Ammonia – The one-hour average concentration of total ammonia nitrogen (in mg N/L) shall not exceed, more than once every three years on the average, the CMC (acute criterion) calculated using the following equations:

Where salmonid fish are present:

$$\text{CMC} = \frac{0.275}{1 + 10^{7.204 - \text{pH}}} + \frac{39.0}{1 + 10^{\text{pH} - 7.204}}$$

Or where salmonid fish are not present:

$$\text{CMC} = \frac{0.411}{1 + 10^{7.204 - \text{pH}}} + \frac{58.4}{1 + 10^{\text{pH} - 7.204}}$$

The thirty-day average concentration of total ammonia nitrogen (in mg N/L) shall not exceed, more than once every three years on the average, the CCC (chronic criterion) calculated using the following equations:

When fish early life stages are present:

$$\text{CCC} = \left[ \frac{0.0577}{1 + 10^{7.688 - \text{pH}}} + \frac{2.487}{1 + 10^{\text{pH} - 7.688}} \right] \text{MIN} (2.85, 1.45 \cdot 10^{0.028(25 - T)})$$

When fish early life stages are absent:

$$\text{CCC} = \left[ \frac{0.0577}{1 + 10^{7.688 - \text{pH}}} + \frac{2.487}{1 + 10^{\text{pH} - 7.688}} \right] 1.45 \cdot 10^{0.028(25 - \text{MAX}(T, 7))}$$

In addition, the highest four-day average within the 30-day period shall not exceed 2.5 times the CCC.

- (j) Nutrients - The waters shall not contain nutrients in concentrations that stimulate aquatic plant and/or algae growth to the extent that aquatic habitat is substantially reduced and/or the biological integrity fails to meet regional goals. Additionally, the quality of downstream waters shall not be detrimentally affected.

(Rule 1200-4-3-.03, continued)

Interpretation of this provision may be made using the document Development of Regionally-based Interpretations of Tennessee's Narrative Nutrient Criterion -and/or other scientifically defensible methods.

- (k) Coliform - The concentration of the E. coli group shall not exceed 630 per 100 ml as a geometric mean based on a minimum of 5 samples collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. For the purposes of determining the geometric mean, individual samples having an E. coli group concentration of less than 1 per 100 ml shall be considered as having a concentration of 1 per 100 ml. In addition, the concentration of the E. coli group in any individual sample shall not exceed 2,880 per 100 ml.
- (l) Biological Integrity - The waters shall not be modified through the addition of pollutants or through physical alteration to the extent that the diversity and/or productivity of aquatic biota within the receiving waters are substantially decreased or adversely affected, except as allowed under 1200-4-3-.06.

Interpretation of this provision for any stream which (a) has at least 80% of the upstream catchment area contained within a single bioregion and (b) is of the appropriate stream order specified for the bioregion and (c) contains the habitat (riffle or rooted bank) specified for the bioregion, may be made using the most current revision of the Department's Quality System Standard Operating Procedure for Macroinvertebrate Stream Surveys and/or other scientifically defensible methods.

Interpretation of this provision for all other streams, plus large rivers, reservoirs, and wetlands, may be made using Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers (EPA/841-B-99-002) and/or other scientifically defensible methods. Effects to biological populations will be measured by comparisons to upstream conditions or to appropriately selected reference sites in the same bioregion if upstream conditions are determined to be degraded.

- ~~(m)~~ Habitat - The quality of instream habitat shall provide for the development of a diverse aquatic community that meets regionally-based biological integrity goals. Types of habitat loss can include, but are not limited to: channel and substrate alterations, rock and gravel removal, stream flow changes, accumulation of silt, precipitation of metals, and removal of riparian vegetation. For wadeable streams, the instream habitat within each subcoregion shall be generally similar to that found at reference streams. However, streams shall not be assessed as impacted by habitat loss if it has been demonstrated that the biological integrity goal has been met.

(n) Flow – Stream or other waterbody flows shall support the fish and aquatic life criteria.

- (4) Recreation.
  - (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
  - (b) pH - The pH value shall lie within the range of 6.0 ~~5.5~~ to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
  - (c) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to recreation.

(Rule 1200-4-3-.03, continued)

- (d) Total Suspended Solids. Turbidity or Color - There shall be no total suspended solids, turbidity or color in such amounts or character that will result in any objectionable appearance to the water, considering the nature and location of the water.
- (e) Temperature - The maximum water temperature change shall not exceed 3C° relative to an upstream control point. The temperature of the water shall not exceed 30.5°C and the maximum rate of change shall not exceed 2C° per hour. The temperature of impoundments where stratification occurs will be measured at a depth of 5 feet, or mid- depth whichever is less, and the temperature in flowing streams shall be measured at mid-depth.
- (f) Coliform - The concentration of the E. coli group shall not exceed 126 colony forming units per 100 ml, as a geometric mean based on a minimum of 5 samples collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. For the purposes of determining the geometric mean, individual samples having an E. coli concentration of less than 1 per 100 ml shall be considered as having a concentration of 1 per 100 ml.

Additionally, the concentration of the E. coli group in any individual sample taken from a lake, reservoir, State Scenic River, ~~or Exceptional Tennessee Water or ONRW Tier II or III stream~~ (1200-4-3-.06) shall not exceed 487 colony forming units per 100 ml. The concentration of the E. coli group in any individual sample taken from any other waterbody shall not exceed 941 colony forming units per 100 ml.

- (g) Taste or Odor - The waters shall not contain substances that will result in objectionable taste or odor.
- (h) Nutrients - The waters shall not contain nutrients in concentrations that stimulate aquatic plant and/or algae growth to the extent that the public's recreational uses of the stream or other downstream waters are detrimentally effected. Unless demonstrated otherwise, the nutrient criteria found in 1200-4-3-.03(3)(j) will be considered adequately protective of this use.

- (i) Nutrient Response Criteria for Specific Reservoirs. Pickwick Reservoir: those waters impounded by Pickwick Dam on the Tennessee River. The reservoir has a surface area of 43,100 acres at full pool, 9,400 acres of which are within Tennessee. Chlorophyll *a* (corrected, as described in *Standard Methods for the Examination of Water and Wastewater*, 20<sup>th</sup> Edition, 1998): the mean of the photic-zone (See definition) composite chlorophyll *a* samples collected monthly April through September shall not exceed 18 µg/l, as measured over the deepest point, main river channel, dam forebay.

Guntersville Lake: those waters impounded by Guntersville Dam on the Tennessee River. The lake has a surface area of 69,700 acres at full pool, 1,800 of which are within Tennessee. Chlorophyll *a* (corrected, as described in *Standard Methods for the Examination of Water and Wastewater*, 20<sup>th</sup> Edition, 1998): the mean of the photic-zone composite chlorophyll *a* samples collected monthly April through September shall not exceed 18 µg/l, as measured over the deepest point, main river channel, dam forebay. (The point of compliance for this criterion is in Alabama.)

- (j) Toxic Substances - The waters shall not contain toxic substances, whether alone or in combination with other substances, that will render the waters unsafe or unsuitable for water contact activities including the capture and subsequent consumption of fish and shellfish, or will propose toxic conditions that will adversely affect man, animal, aquatic life, or wildlife. Human health criteria have been derived to protect the consumer from consumption of

(Rule 1200-4-3-.03, continued)

contaminated fish and water. The water and organisms criteria should only be applied to those waters classified for both recreation and domestic water supply. The criteria for recreation are as follows:

Compound	Water & Organisms Criteria * (ug/L)	Organisms Only Criteria (ug/L)
<u>INORGANICS</u>		
Antimony	5.6	640
Arsenic (c)	10.0	10.0
Compound	Water & Organisms Criteria * (ug/L)	Organisms Only Criteria (ug/L)
Mercury	0.05	0.051
Nickel	610	4600
Thallium	<del>1.7</del> 0.24	<del>6.3</del> 0.47
Cyanide	<del>700</del> 140	<del>220000</del> 140
Dioxin **	0.000001	0.000001
<u>VOLATILES</u>		
Acrolein	190	290
Acrylonitrile (c)	0.51	2.5
Benzene (c)	22	510
Bromoform (c)	43	1400
Carbon tetrachloride (c)	2.3	16
Chlorobenzene	<del>680</del> 130	<del>21000</del> 1600
Chlorodibromomethane (c)	4.0	130
Chloroform (c)	57	4700
Dichlorobromomethane (c)	5.5	170
1,2-Dichloroethane (c)	3.8	370
1,1-Dichloroethylene (c)	<del>0.57</del> 3300	<del>32</del> 71000
1,2-Dichloropropane (c)	5.0	150
1,3-Dichloropropene	<del>10</del> 0.34	<del>1700</del> 21
Ethylbenzene	<del>3100</del> 530	<del>29000</del> 2100
Methyl bromide	47	1500
Methylene chloride (c)	46	5900
1,1,2,2-Tetrachloroethane (c)	1.7	40

(Rule 1200-4-3-.03, continued)

Tetrachloroethylene (c)	6.9	33
Toluene	<del>6800</del> <u>1300</u>	<del>200000</del> <u>15000</u>
1,2-Trans-Dichloroethylene	<del>700</del> <u>140</u>	<del>140000</del> <u>10000</u>
1,1,2-Trichloroethane (c)	5.9	160
Trichloroethylene (c)	25	300
Vinyl chloride (c)	<del>20</del> <u>0.25</u>	<del>5300</del> <u>24</u>

ACID EXTRACTABLES

2-Chlorophenol	81	150
2,4-Dichlorophenol	77	290
2,4-Dimethylphenol	380	850
2-Methyl-4,6-dinitrophenol	13	280
2,4-Dinitrophenol	69	5300
Pentachlorophenol (c) (pH)	2.7	30
Phenol	21000	1700000
2,4,6-Trichlorophenol (c)	14	24

BASE NEUTRALS

Acenaphthene	670	990
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Compound	Water & Organisms Criteria * (ug/L)	Organisms Only Criteria (ug/L)
Anthracene	8300	40000
Benzidine (c)	0.00086	0.0020
Benzo(a)anthracene (c)	0.038	0.18
Benzo(a)pyrene (c)	0.038	0.18
Benzo(b)fluoranthene (c)	0.038	0.18
Benzo(k)fluoranthene (c)	0.038	0.18
Bis(2-Chlorethyl)ether (c)	0.30	5.3
Bis(2-Chloro-isopropyl)ether	1400	65000
Bis(2-Ethylhexyl)phthalate (c)	12	22
Butylbenzyl Phthalate	1500	1900
2-Chloronaphthalene	1000	1600
Chrysene (c)	0.038	0.18
Dibenz(a,h)Anthracene (c)	0.038	0.18
1,2-Dichlorobenzene	<del>2700</del> <u>420</u>	<del>17000</del> <u>1300</u>
1,3-Dichlorobenzene	320	960
1,4-Dichlorobenzene	<del>400</del> <u>63</u>	<del>2600</del> <u>190</u>
3,3-Dichlorobenzidine (c)	0.21	0.28
Diethyl phthalate	17000	44000
Dimethyl phthalate	270000	1100000
Di-n-butyl phthalate	2000	4500
2,4-Dinitrotoluene (c)	1.1	34
1,2-Diphenylhydrazine (c)	0.36	2.0
Fluoranthene	130	140
Fluorene	1100	5300
Hexachlorobenzene (c)	0.0028	0.0029
Hexachlorobutadiene (c)	4.4	180
Hexachlorocyclopentadiene	<del>240</del> <u>40</u>	<del>17000</del> <u>1100</u>
Hexachloroethane (c)	14	33
Ideno(1,2,3-cd)Pyrene (c)	0.038	0.18

(Rule 1200-4-3-.03, continued)

Isophorone (c)	350	9600
Nitrobenzene	17	690
N-Nitrosodimethylamine (c)	0.0069	30
N-Nitrosodi-n-Propylamine (c)	0.05	5.1
N-Nitrosodiphenylamine (c)	33	60
Pyrene	830	4000
1,2,4-Trichlorobenzene	<del>260</del> <u>35</u>	<del>940</del> <u>70</u>

PESTICIDES

Aldrin (c)	0.00049	0.00050
a-BHC (c)	0.026	0.049
b-BHC (c)	0.091	0.17
g-BHC - Lindane (c)	<del>0.19</del> <u>9.8</u>	<del>0.63</del> <u>18</u>
Chlordane (c)	0.0080	0.0081
4-4'-DDT (c)	0.0022	0.0022
4,4'-DDE (c)	0.0022	0.0022
4,4'-DDD (c)	0.0031	0.0031
Dieldrin (c)	0.00052	0.00054

Compound	Water & Organisms Criteria * (ug/L)	Organisms Only Criteria (ug/L)
a-Endosulfan	62	89
b-Endosulfan	62	89
Endosulfan Sulfate	62	89
Endrin	<del>0.76</del> <u>0.059</u>	<del>0.81</del> <u>0.06</u>
Endrin Aldehyde	0.29	0.30
Heptachlor (c)	0.00079	0.00079
Heptachlor epoxide (c)	0.00039	0.00039
PCB aroclors (c) (EPA 119-125)	0.00064	0.00064
PCB, total (c)	0.00064	0.00064
Toxaphene (c)	0.0028	0.0028

(c) 10<sup>-5</sup> risk level is used for all carcinogenic pollutants.

\* These criteria are for protection of public health due to consumption of water and organisms and should only be applied to these waters designated for both recreation and domestic water supply.

\*\* Total dioxin is the sum of the concentrations of all dioxin and dibenzofuran isomers after multiplication by Toxic Equivalent Factors (TEFs). Following are the TEFs currently recommended by EPA (subject to revision):

DIOXIN ISOMERS	TEF	FURAN ISOMERS	TEF
Mono-, Di-, & TriCDDs	0.0	Mono-, Di-, & TriCDFs	0.0
2,3,7,8 TCDD	1.0	2,3,7,8 TCDF	0.1
Other TCDDs	0.0	Other TCDFs	0.0
2,3,7,8 PeCDD	0.5	1,2,3,7,8 PeCDF	0.05
Other PeCDDs	0.0	2,3,4,7,8 PeCDF	0.5
		Other PeCDFs	0.0

(Rule 1200-4-3-.03, continued)

2,3,7,8 HxCDD	0.1	Other PeCDFs	0.0
Other HxCDDs	0.0	2,3,7,8 HxCDF	0.1
		Other HxCDFs	0.0
2,3,7,8 HpCDD	0.01	2,3,7,8 HpCDF	0.01
Other HpCDDs	0.0	Other HpCDFs	0.0
OCDD	0.001	OCDF	0.001

(k) Other Pollutants - The waters shall not contain other pollutants in quantities which may have a detrimental effect on recreation.

(l) Fish Consumption Advisories - A public fishing advisory will be considered when the calculated risk of additional cancers exceeds  $10^{-4}$  for typical consumers or  $10^{-5}$  for atypical consumers (See definition). A "do not consume" advisory will be issued for the protection of typical consumers and a "precautionary advisory" will be issued for the protection of atypical consumers. The following formula will be used to calculate the risk of additional cancers :

$$R = qE$$

where:

R= Plausible-upper-limit risk of cancer associated with a chemical in a fisheries species for a human subpopulation.

q = Carcinogenic Potency Factor for the chemical ( $\text{mg kg}^{-1} \text{ day}^{-1}$ )<sup>-1</sup> estimated as the upper 95 percent confidence limit of the slope of a linear dose-response curve. Scientifically defensible Potency Factors will be used.

E = Exposure dose of the chemical ( $\text{mg kg}^{-1} \text{ day}^{-1}$ ) from the fish species for the human subpopulation in the area. E is calculated by the following formula:

$$E = \frac{C I X}{W} \quad \text{where:}$$

C = Concentration of the chemical (mg/kg) in the edible portion of the species in the area. The average levels from multiple fillet samples of the same species will be used. Catfish will be analyzed skin-off with the belly flap included in the sample. Gamefish and carp will be analyzed skin-on with the belly flap included in the sample. Sizes of fish collected for analysis will represent the ranges of sizes likely to be collected and consumed by the public. References on this subject include, but are not limited to: EPA's Guidance for Assessing Chemical Contaminant Data for use in Fish Advisories.

I = Mean daily consumption rate (g/day averaged over 70 year lifetime) of the fish species by the human subpopulation in the area. 6.5 g/day will be used unless better site-specific information is available.

X = Relative absorption coefficient, or the ratio of human absorption efficiency to test animal absorption efficiency of the chemical. Assumed to be 1.0 unless better information is available.

(Rule 1200-4-3-.03, continued)

W =Average human mass (kg). 75 kg will be used.

For substances for which the public health concern is based on toxicity, a "do not consume" advisory will be considered warranted when average levels of the substance in the edible portion of fish exceed U.S. Food and Drug Administration (FDA) Action Levels.

(m) Flow – Stream flows shall support recreational uses.

(5) Irrigation.

- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
- (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
- (c) Hardness or Mineral Compounds - The hardness of or the mineral compounds contained in the water shall not impair its use for irrigation.
- (d) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character as may impair the usefulness of the water for irrigation purposes.
- (e) Temperature - The temperature of the water shall not interfere with its use for irrigation purposes.
- (f) Toxic Substances - The waters shall not contain toxic substances whether alone or in combination with other substances which will produce toxic conditions that adversely affect the quality of the waters for irrigation.
- (g) Other Pollutants - The waters shall not contain other pollutants in quantities which may be detrimental to the waters used for irrigation.

(6) Livestock Watering and Wildlife.

- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
- (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
- (c) Hardness or Mineral Compounds - The hardness of or the mineral compounds contained in the water shall not impair its use for livestock watering and wildlife.
- (d) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character as to interfere with livestock watering and wildlife.
- (e) Temperature - The temperature of the water shall not interfere with its use for livestock watering and wildlife.



(Rule 1200-4-3-.03, continued)

- (f) Toxic Substances - The waters shall not contain substances whether alone or in combination with other substances, which will produce toxic conditions that adversely affect the quality of the waters for livestock watering and wildlife.
  - (g) Other Pollutants - The waters shall not contain other pollutants in quantities which may be detrimental to the water for livestock watering and wildlife.
- (7) Navigation.
- (a) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character as to interfere with navigation.
  - (b) Other Pollutants - The waters shall not contain other pollutants in quantities which may be detrimental to the waters used for navigation.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999. Amendment filed October 24, 2003; effective January 7, 2004.

#### 1200-4-3-.04 DEFINITIONS.

- (1) Conventional Water Treatment - Conventional water treatment as referred to in the criteria denotes coagulation, sedimentation, filtration, and chlorination or disinfection.
- (2) Mixing Zone - That section of a flowing stream or impounded waters in the immediate vicinity of an outfall where an effluent becomes dispersed and mixed.
- (3) Wet Weather Conveyance - Wet weather conveyances are man-made or natural watercourses, including natural watercourses that have been modified by channelization, that flow only in direct response to precipitation runoff in their immediate locality and whose channels are above the groundwater table and which do not support fish or aquatic life and are not suitable for drinking water supplies. [T.C.A. § 4-5-202, T.C.A. § 69-3-105.]
- ~~(4) (4)~~ — Degradation - The alteration of the properties of waters by the addition of pollutants or removal of habitat.

(5) *De Minimis* - Alterations not resulting in the condition of pollution that ~~are represent either a small magnitude or a short duration shall be considered a *de minimis* impact and will not be considered degradation.~~ of a temporary nature or those alterations having de minimus impact (no measurable or less than 5 percent loss of assimilative capacity) will not be considered degradation for purposes of implementing the antidegradation policy. Discharges will be considered *de minimis* if they are temporary or use less than five percent of the available assimilative capacity for the substance being discharged. Water withdrawals will be considered *de minimis* if less than five percent of the 7Q10 flow of the stream is removed (the calculations of the low flow shall take into account existing withdrawals). Habitat alterations authorized by an Aquatic Resource Alteration Permit (ARAP) are *de minimis* if the division finds that the impacts are offset by a combination of impact minimization and/or in-system mitigation. Stream habitat alterations that require an individual Aquatic Resources Alteration Permit (ARAP) shall not be considered *de minimis*, unless a combination of impact minimization and/or in-system mitigation renders the impacts to be of an appropriately small magnitude or short duration.

If more than one activity has been authorized in a segment and the total of the impacts uses no more than

~~The limit on cumulative *de minimis* degradation is ten percent of the assimilative capacity, available habitat, or 7Q10 low flow, they are presumed to be *de minimis*. -Where total impacts use more than ten percent of the assimilative capacity, available habitat, or 7Q10 low flow they may be treated as *de minimis* provided that the division finds on a scientific basis that the additional degradation has an insignificant effect on the resource and that no single activity is allowed to consume more than five percent of the assimilative capacity, available habitat or 7Q10 low flow. Degradation will not be considered *de minimis* if a substantial loss (more than 50 percent) of assimilative capacity has already occurred.~~

- (65) Ecoregion - A relatively homogeneous area defined by similarity of climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variables.
- (67) Subcoregion - A smaller, more homegenous area that has been delineated within an ecoregion.
- (78) Reference ~~site~~ Site - ~~least~~ Least impacted waters within an ecoregion that have been monitored to establish a baseline to which alterations of other waters can be compared.
- (89) Reference condition - A parameter-specific set of data from regional reference sites that establish the statistical range of values for that particular substance at least-impacted streams.
- (910) Atypical consumers ~~are—those~~ Those persons in the vicinity of a stream or lake who due to physiological factors or previous exposure are more sensitive to specific pollutants than is the population in general. Examples of atypical consumers may include, but are not limited to: children; pregnant or nursing women; subsistence fishermen; frequent purchasers of commercially harvested fish; and agricultural, industrial, or military personnel who may have had previous occupational exposure to the contaminant of concern.
- ~~(4011) Stratification – The tendency in lakes and reservoirs for distinct layers of water to form as a result of vertical change in temperature and, therefore, in the density of water. During stratification, dissolved oxygen, nutrients, and other parameters of water chemistry do not mix well between layers, establishing chemical as well as thermal gradients.~~
- ~~(142) Epilimnion – The upper layer of water in a thermally stratified lake or reservoir. This layer consists of the warmest water and has a fairly uniform (constant) temperature.~~
- ~~(123) Thermocline – The middle layer in a thermally stratified lake or reservoir. In this layer there is a rapid decrease in temperature with depth. Also called the metalimnion.~~
- ~~(134) Hypolimnion - The lowest layer in a thermally stratified lake or reservoir. This layer consists of colder, more dense water, has a constant temperature and no mixing occurs. The hypolimnion of a eutrophic lake is usually low or lacking in oxygen.~~
- ~~(145) Photic Zone - the region of water through which light penetrates and where photosynthetic organisms live.~~
- (15610) Terminology not specifically defined herein shall be defined in accordance with the Tennessee Water Quality Control Act. [T.C.A. §§ 69-3-101, et seq.]

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999. Amendment filed October 24, 2003; effective January 7, 2004.

(Rule 1200-4-3-.05, continued)

#### 1200-4-3-.05 INTERPRETATION OF CRITERIA.

- (1) Interpretation of the above criteria shall conform to any rules and regulations or policies adopted by the Water Quality Control Board.
- (2) The effect of treated sewage or waste discharge on the receiving waters shall be considered beyond the mixing zone except as provided in this paragraph. after they are mixed with the waters and beyond a reasonable zone of immediate effect. The extent to which this is practicable depends upon local conditions and the proximity and nature of other uses of the waters. Such mixing zones (See definition) shall be restricted in area and length and shall not (i) prevent the free passage of fish or cause aquatic life mortality in the receiving waters; (ii) contain materials in concentrations that exceed ~~recognized acute~~ criteria toxicity levels; beyond the zone immediately surrounding the outfall; for biota representative of the aquatic community in the receiving waters; (iii) result in offensive conditions; (iv) produce undesirable aquatic life or result in dominance of a nuisance species; (v) endanger the public health or welfare; or (vi) adversely affect the reasonable and necessary uses of the area; (vii) create a condition of chronic toxicity beyond the edge of the mixing zone; ~~and~~ (viii) adversely affect nursery and spawning areas; and (ix) adversely affect species with special state or federal status.
- (3) The technical and economical feasibility of waste treatment, recovery, or adjustment of the method of discharge to provide correction shall be considered in determining the time to be allowed for the development of practicable methods and for the specified correction, to the extent allowable under Rule 1200-4-3-.06 (5).
- (4) ~~With the exception of nutrient criteria [(1200-4-3-.03(3)(i))],~~ Water quality criteria for the fish and aquatic life and livestock watering and wildlife criteria set forth shall generally be applied on the basis of the following stream flows: unregulated streams - stream flows equal to or exceeding the 7-day minimum, 10-year recurrence interval; regulated streams - all flows in excess of the minimum critical flow occurring once in ten years as determined by ~~an analysis of records of operation and approved by the Commissioner of the Tennessee Department of Environment and Conservation division.~~ However, criteria that are wholly or partially based on direct measurements of ambient aquatic community health, such as the nutrient, biological integrity, and habitat criteria for the fish and aquatic life use, shall be applied in a way to ensure that the criteria are supportive of the designated use. These criteria should be considered independent of a specified minimum flow duration and recurrence. All other criteria, ~~including nutrient criteria under the fish and aquatic life use,~~ shall be applied on the basis of stream flows equal to or exceeding the 30 day minimum 5 year recurrence interval.
- (5) In general, deviations from normal water conditions are undesirable, but the magnitude and duration of the deviations shall be considered in interpreting the above criteria. When interpreting pathogen data, samples collected during or immediately after significant rain events may be treated as outliers unless caused by point source dischargers. Such outlier data may be given less weight in assessment decisions than non-rain event sampling results.
- (6) The criteria and standards provide that all discharges of sewage, industrial waste, and other waste shall receive the degree of treatment or effluent reduction necessary to comply with water quality standards, or state or federal laws and regulations pursuant thereto, and where appropriate will comply with the "Standards of Performance" as required by the Tennessee Water Quality Control Act, (T.C.A., §§69-3-101, et seq.).
- (7) Where naturally formed conditions (e.g., geologic formations) or background water quality conditions are substantial impediments to attainment of the water quality standards, these natural or background conditions shall be taken into consideration in establishing any effluent limitations or restrictions on discharges to such waters.

(Rule 1200-4-3-.05, continued)

- (8) There are cases in which the in-stream criteria as established by this rule are less than current chemical technological capabilities for analytical detection. In instances where permit limits established through implementation of these criteria are below analytical capabilities, compliance with those limits will be determined using the following detection limits, unless in specific cases other detection limits are demonstrated to be the best achievable because of the particular nature of the wastewater being analyzed:

## REQUIRED DETECTION LEVELS [RDL] (ug/l)

<u>INORGANICS</u>	<u>RDL</u>	<u>BASE NEUTRALS</u>	<u>RDL</u>
Antimony	3.0	Acenaphthylene (c)	2.3
Arsenic, total (c)	1.0	Anthracene	0.7
Arsenic (III) (c)	1.0	Benzo(a)anthracene (c)	0.3
Beryllium (c)	1.0	Benzo(a)pyrene (c)	0.3
Cadmium	1.0	3,4-Benzofluoranthene (c)	0.3
Chromium, total	1.0	Benzo(k)fluoranthene (c)	0.3
Chromium (III)	1.0	Bis(2-Chloroethyl)ether (c)	1.0
Chromium (VI)	10.0	Bis(2-Ethylhexyl)phthalate(c)	2.5
Copper	1.0	Chrysene	2.5
Lead	1.0	1,2-Dichlorobenzene	2.0
Mercury	0.2	1,3-Dichlorobenzene	2.0
Nickel	10.0	1,4-Dichlorobenzene -	
Selenium	2.0	para-Dichlorobenzene	4.4
Silver	1.0	Diethyl phthalate	1.9
Zinc	1.0	Dimethyl phthalate	1.6
Cyanide	5.0	Di-n-Butyl phthalate	2.5
		2,4-Dinitrotoluene (c)	1.0
Dioxin	0.00001	Fluoranthene	2.2
		Fluorene	0.3
<u>VOLATILES</u>		Hexachlorobenzene (c)	1.9
Acrolein	1.0	Hexachlorobutadiene (c)	5.0
Acrylonitrile (c)	1.0	Hexachloroethane (c)	0.5
Benzene (c)	1.0	Nitrobenzene	10.0
Bromoform -		Phenanthrene	0.7
Tribromomethane (c)	1.0	Pyrene	0.3
Carbon tetrachloride (c)	1.0		
Chloroform -		<u>PESTICIDES</u>	
Trichloromethane (c)	0.5	Aldrin (c)	0.5
Dichlorobromomethane (c)	1.0	g-BHC - Lindane (c)	0.5
1,2-Dichloroethane (c)	1.0	Chlordane (c)	0.1
1,1-Dichloroethylene (c)	1.0	4-4'-DDT (c)	0.1
1,3-Dichloropropylene	1.0	4,4'-DDE (c)	0.1
Ethylbenzene	1.0	4,4'-DDD (c)	0.1
Methyl chloride -		Dieldrin (c)	0.05
Chloromethane (c)	1.0	a-Endosulfan	0.1
Methylene chloride -		b-Endosulfan	0.05
Dichloromethane (c)	1.0	Endrin	0.1
1,1,2,2-Tetrachloroethane (c)	0.5	Heptachlor (c)	0.05
Tetrachloroethylene (c)	0.5	Heptachlor epoxide (c)	0.08
Toluene	1.0	PCB-1242 (c)	0.5
1,1,1-Trichloroethane	1.0	PCB-1254 (c)	0.5
1,1,2-Trichloroethane (c)	0.2	PCB-1221 (c)	0.5
Trichloroethylene (c)	1.0	PCB-1232 (c)	0.5
Vinyl chloride (c)	2.0	PCB-1248 (c)	0.5
		PCB-1260 (c)	0.5
<u>ACID EXTRACTABLES</u>		PCB-1016 (c)	0.5
2-Methyl-4,6-dinitrophenol-		PCB, total (c)	0.5
4,6-Dinitro-o-cresol	24.0	Toxaphene (c)	0.5
2,4-Dinitrophenol	42.0		
Pentachlorophenol	5.0		

(Rule 1200-4-3-.05, continued)

2,4,6-Trichlorophenol (c)

2.7

(c) - carcinogen

- ~~(9) The criteria shall be applied using the total recoverable method, unless otherwise specified, or the Division conducts or approves a chemical speciation study which determines the bioavailable or toxic fraction of a specific chemical.~~

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999. Amendment filed October 24, 2003; effective January 7, 2004.

#### 1200-4-3-.06 ~~TENNESSEE~~ ANTIDEGRADATION STATEMENT.

- (1) It is the purpose of Tennessee's standards to fully protect existing uses of all surface waters as established under the Act. Existing uses are those actually attained in the waterbody on or after November 28, 1975. ~~Sources exempted from permit requirements under the Water Quality Control Act should utilize all cost-effective and reasonable best management practices. Additionally, the Tennessee Water Quality Standards shall not be construed as permitting the degradation (See definition) of high quality surface waters.~~ Activities that cause or contribute to non-compliance with a water quality standard will not be allowed. Activities proposed for waters that are not identified as either being Exceptional Tennessee Waters (1200-4-3-.06(4)) or Outstanding National Resource Waters (1200-4-3-.06(5)), will be evaluated on the basis of 1200-4-3-.06(2) and (3). ~~Tier 1 and Tier 2 waters shall be identified on a parameter by parameter basis.~~
- ~~-(2) Unavailable conditions exist where water quality is at, or fails to meet, the criterion for one or more parameters. In unavailable conditions, new or increased discharges of a substance that would cause or contribute to a condition of impairment will not be allowed. Where impairment by habitat alteration exists, additional significant loss of habitat within the same area of influence shall not be authorized unless avoidance, minimization, or in-system mitigation can render the impact de minimis. Tier 1—In bodies of water identified as Tier I by the Division, existing uses will be maintained by application of the General Water Quality Criteria. In Tier I waters found to be at or not meeting not meet a water quality standards for a substance, new or increased discharges of that substance will not be allowed. In waters identified as impacted by habitat alteration, additional significant loss of habitat shall not be authorized unless avoidance, minimization, or in system mitigation can render the impact de minimis.~~
- ~~(3) Available conditions exist where water quality is better than the applicable criterion for a specific parameter. In available conditions, new or additional degradation for that parameter will only be allowed if the applicant has demonstrated to the division that reasonable alternatives to degradation are not feasible.~~
- ~~(a) Analysis of reasonable alternatives shall be part of the application process and shall include a discussion of the feasibility of all potential alternatives, plus the social and economic considerations and environmental consequences of each. Alternatives analyses shall include, at a minimum, completed and accurate Worksheets A and B for public sector applicants or Worksheets A and G for private system applicants, except where these worksheets are inappropriate for the activity, in which case applicants may substitute materials that provide equivalent information. These forms are found in the EPA guidance document entitled Interim Economic Guidance for Water Quality Standards: Workbook (EPA 823/B-95-002) (Economic Guidance). Reasonable alternatives for the various activities include, but are not limited to the following actions. Tier 2: Waters With Assimilative Capacity—For substances or conditions not currently at or in violation of water quality standards, new or additional degradation will only be~~

(Rule 1200-4-3-.06, continued)

~~allowed if the applicant has demonstrated to the Department that reasonable alternatives to degradation are not feasible. Reasonable alternatives for the various activities discharges include, but are not limited to~~

- ~~1. Alternatives for discharges include connection to an existing collection system, land application, water reuse, or water recycling. For small domestic discharges, connection to an existing system or land application will be considered preferable.~~
- ~~2. For water withdrawals, alternatives include water conservation, water reuse or recycling, off-stream impoundments, water harvesting during high flow conditions, regionalization, withdrawing water from a larger water body, use of ground water, connection to another water supply with available capacity, and pricing structures that encourage a reduction in consumption.~~
- ~~3. For activities that cause habitat alterations, alternatives that minimize or avoid degradation should be explored and explained by the applicant. These avoidance or minimization activities could include maintaining or enhancing buffer zones, bridging a stream rather than culverting it, altering the footprint of a project instead of relocating a stream, or using a culvert without a bottom, instead of one that is fully concreted.~~

~~Sources exempted from permit requirements under the Water Quality Control Act should utilize all cost-effective and reasonable best management practices.~~

~~The alternatives analysis shall be part of the application process and shall include a discussion of the feasibility of all potential alternatives, plus the social and economic considerations, and environmental consequences of each potential alternative. Alternatives analyses shall include, at a minimum, completed and accurate Worksheets A and B for public sector applicants or Worksheets A and G for private system applicants, except where these worksheets are inappropriate for the activity, in which case applicants may substitute materials that provide equivalent information. These forms are found in the EPA guidance document entitled Interim Economic Guidance for Water Quality Standards: Workbook (EPA 823/B-95-002) (Economic Guidance).~~

- ~~(b) For authorized new or expanded discharges, a record of the antidegradation determination(s) will be maintained and will be available for public review. Public participation will be provided in conjunction with permitting activities.~~

- ~~(42) Exceptional Tennessee Waters (Tier 2.5) are: Following are the specific characteristics of Exceptional Tennessee Water: The Tennessee Water Quality Standards shall not be construed as permitting the degradation (See definition) of high quality surface waters. High quality waters are Tier II or Tier III. In Tennessee, Tier III waters are also referred to as Outstanding National Resource Waters (ONRWs). Characteristics of high quality waters include:~~

- ~~(a) Waters within state or national parks, wildlife refuges or management areas, forests, wilderness areas, or natural areas.~~

- ~~(b) State Scenic Rivers or Federal Wild and Scenic Rivers.~~

- ~~(c) (3) Federally-designated critical habitat or other waters with documented that provide habitat for ecologically significant populations of state or federally-listed threatened or endangered aquatic or semi-aquatic plants or animals, including those proposed or listed for formal state or federal status.~~

- ~~(d) (4) Waters within areas federally-designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act.~~

(Rule 1200-4-3-.06, continued)

~~(e) (5b) Naturally reproducing trout streams. Waters that provide specialized recreational opportunities related to existing water quality.~~

~~(f) (6e) Waters with exceptional biological diversity as evidenced by a score of 40 or 42 on the Tennessee Macroinvertebrate Index (or a score of 28 or 30 in subcoregion 73a), provided that the sample is considered representative of overall stream conditions. Waters that possess outstanding scenic or geologic values.~~

~~(d) Waters where existing conditions exceed water quality standards.~~

~~— The following wThe division will maintain a list of waterbodies that have been reviewed and are known to have one or more of the above characteristics on its website and will make paper copies of that list available upon request. However, the Exceptional Tennessee Waters are not limited to this list.~~

~~(3) (bag)~~ In ~~other~~ waters identified by the Department as Exceptional Tennessee Waters Tier II high quality waters in accordance with 1200-4-3-.06(2); no degradation will be allowed unless and until it is affirmatively demonstrated to the Department, after full satisfaction of the following intergovernmental and public participation provisions, that a change is justified as a result of necessary economic or social development and will not interfere with or become injurious to any classified uses existing in such waters. At the time of permit renewal, previously authorized discharges, including upstream discharges, which presently degrade Exceptional Tennessee Waters Tier II waters, will be subject to alternatives analysis, but not to a determination of economic/social necessity. Public participation for these existing discharges will be provided in conjunction with permitting activities. Sources exempted from permit requirements under the Water Quality Control Act should utilize all cost-effective and reasonable best management practices.

~~(ebh)~~ Determination of Economic/Social Necessity - Where reasonable alternatives to degradation to an Exceptional Tennessee Water is Tier II stream are not feasible, applicants may ask the Department to determine that the proposed degradation is justified on the basis of economic or social necessity. The applicant shall have the burden of establishing to the Department that a change is justifiable as a result of necessary economic or social development and will not interfere with or become injurious to any classified uses existing in such waters. The Department's determination that degradation is justified or unjustified shall be subject to review by the Water Quality Control Board under the following procedures.

1. If the Department determines that degradation is justified, it will notify the applicant, the federal and state intergovernmental coordination agencies, and third persons who requested notification of the determination. Within 30 days after the date of the notification, any affected intergovernmental coordination agency or affected third person may petition the Board for a declaratory order under Tennessee Code Annotated § 4-5-223, and the Board shall convene a contested case. After the Board has convened a contested case in response to a declaratory order petition under this part, the Department shall within 5 business days thereafter transmit the petition to the Administrative Procedures Division of the Secretary of State so the contested case may be docketed and an administrative law judge may be assigned to the case. If a declaratory order petition is timely filed, the Department shall not proceed further in processing the permit application until the petition has been resolved before the Board. In the contested case, the petitioner shall have the burden of proof, and the Department's determination shall carry no presumption of correctness before the Board. The applicant is a necessary party



(Rule 1200-4-3-.06, continued)

to the declaratory order contested case, and if the applicant does not participate in the contested case, the Board shall render a decision that degradation is not justified. If no intergovernmental coordination agency or third person petitions for a declaratory order within 30 days of the notification date, then the Department shall proceed with processing the permit application.

2. A declaratory order contested case conducted under this provision shall be subject to the following procedures. Mediation may occur if all the parties agree. Any proposed agreed order resulting from mediation shall be subject to approval by the Board. In order to provide for an expedited proceeding, the contested case is subject to the following time limitations. The time periods specified in this part shall commence on the day after the contested case has been docketed by the Administrative Procedures Division of the Secretary of State and an administrative law judge has been assigned to the case. Any alteration of the time periods set out in this part shall be granted only upon agreement of all the parties, or when there have been unforeseen developments that would cause substantial prejudice to a party, or when the parties have agreed to mediation. Within 20 days, the parties shall confer to try and develop a proposed agreed scheduling order. If the parties are unable to agree, then each party shall submit a proposed scheduling order, and the administrative law judge, after a hearing, shall enter a scheduling order. All discovery shall be completed no later than 20 days prior to the date the hearing before the Board is to begin. Within 120 days, the hearing before the Board shall begin, but the Board on its own initiative may exceed 120 days to complete the hearing and render its final decision. In order for degradation of Exceptional Tennessee Waters Tier II waters to proceed pursuant to these rules, the Board must make a finding approving degradation by a majority vote of the members of the Board present and voting.
3. If the Department determines that degradation is not justified, it will notify the applicant, the federal and state intergovernmental coordination agencies, and third persons who requested notification of the determination. The Department also will issue a tentative decision to deny the permit because degradation is not justified. In accordance with 1200-4-1-.05(3), the Department will provide the public with notice of and an opportunity to comment on its tentative denial decision. If no public hearing is requested within the 30 day public comment period, and if the Department does not alter its tentative decision to deny, the Department shall notify the applicant of its final decision to deny the permit because degradation is not justified. Within 30 days after receiving notice of the final decision to deny the permit, the applicant may seek review of the decision in a contested case before the Board in accordance with Tennessee Code Annotated § 69-3-105(i). Within 5 business days after the Department receives an applicant's written request for a contested case hearing before the Board, the Department shall transmit the written request to the Administrative Procedures Division of the Secretary of State so the contested case may be docketed and an administrative law judge may be assigned to the case. In the contested case, the applicant shall have the burden of proof, and the Department's determination shall carry no presumption of correctness before the Board. The federal and state intergovernmental coordination agencies, and third persons who requested notification of the Department's degradation determination will be notified by the Department of the applicant's permit appeal. The intergovernmental coordination agencies and third persons may seek to intervene in the contested case in accordance with Tennessee Code Annotated § 4-5-310.

(ei) Information Requirements:

1. Applicants requesting an economic/social necessity determination to allow degradation under this provision must provide all information required in order for the Department to make a determination that reasonable alternatives to degradation are not feasible.



(Rule 1200-4-3-.06, continued)

Reasonable alternatives for discharges may include, but are not limited to, connection to an existing collection system, land application, water reuse, or water recycling. Applicants for permit renewals of previously authorized discharges, including upstream discharges, which presently degrade Exceptional Tennessee Waters, Tier II waters, shall submit as an alternatives analysis completed and accurate Worksheets A and B for public sector applicants or Worksheets A and G for private system applicants, except where these worksheets are inappropriate for the activity, in which case applicants may substitute materials that provide equivalent information. If needed, the Department may request the applicant to provide additional information. Alternatives analysis for new or additional degradation shall include, at a minimum, completed and accurate Worksheets A and B for public sector applicants or Worksheets A and G for private system applicants, except where these worksheets are inappropriate for the activity, in which case applicants may substitute materials that provide equivalent information. These forms are found in the EPA guidance document (Economic Guidance).

2. Additionally, to provide information to the Department regarding the applicant's claim of economic/social necessity, public sector applicants shall complete and submit, at a minimum, Forms O, P, Q, S, T, U, and AA, found in the EPA guidance document (Economic Guidance). Private sector applicants shall complete and submit, at a minimum, Forms O, R, V, W, X, Y, Z, and AB, found in the EPA guidance document (Economic Guidance). In instances when these worksheets are inappropriate for the activity, those applicants may substitute materials that provide equivalent information.

(d) Public Participation:

1. NPDES - Applicants seeking permission to degrade Exceptional Tennessee Waters, Tier II waters shall publish a notice in a newspaper of general distribution in the area of the degradation. The notice shall identify the proposed discharge, provide the specific location including affected waters, describe the general basis for requesting permission to degrade Exceptional Tennessee Waters, Tier II waters, inform the public of their opportunity to provide comments, and that a local public meeting will be held by the Department unless the Department notifies the public of its determination that the discharge will not result in degradation. The applicant shall also post a sign within sight of a public road containing the same general information as the newspaper notice. A copy of the newspaper notice and proof of signage shall be provided to the Department. The public meeting held by the Department shall be near the proposed degradation.
2. ARAP/Section 401 Water Quality Certification - If the Department determines that an applicant's proposed activity will not result in degradation, it will so notify the public. If the Department determines that the proposed activity will degrade Exceptional Tennessee Waters, Tier II waters, and the applicant intends to seek permission to do so, then the applicant shall publish a notice in a newspaper of general distribution in the area of the degradation. The notice shall identify the proposed activity, provide the specific location including affected waters, describe the general basis for requesting permission to degrade Exceptional Tennessee Waters, Tier II waters, inform the public of their opportunity to submit comments, and that a local public meeting will be held by the Department. The public meeting held by the Department shall be near the proposed degradation.
3. Timing of Public Participation - Within 14 days of the Department being informed that an applicant will seek degradation, the applicant shall provide notice, as identified above, to the affected public. After the applicant provides public notice, the Department shall notify the public of the location, date and time of the public meeting in the area of degradation. Public notice by the Department shall occur at least 45 days prior to the

(Rule 1200-4-3-.06, continued)

meeting. For a proposed discharge, if the Department determines that the discharge will not result in degradation, it will so notify the public and in this circumstance, there will be no public meeting.

~~(e)(k)~~ Intergovernmental Coordination - A notice concerning the request for an economic/social necessity determination shall be provided by the Department to federal and state agencies with jurisdiction over fish, wildlife, shellfish, plant and wildlife resources, parks, and advisory councils for historic preservation.

- (5) The Department may recommend to the Water Quality Control Board that certain waterbodies be designated as Outstanding National Resource Waters (ONRWs). These shall be high quality waters which constitute an outstanding ~~National~~-national resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance.

Designation of ONRWs must be made by the Water Quality Control Board and will be accomplished in accordance with Section 69-3-105(a)(1) of the Tennessee Water Quality Control Act and through the appropriate rulemaking process.

In surface waters designated by the Water Quality Control Board as ONRWs, no new discharges, expansions of existing discharges, or mixing zones will be permitted unless such activity will not result in degradation of the water quality. Existing water quality will be the criteria in these waters. Physical alterations that cause degradation to the ONRW will not be allowed. At time of permit renewal, previously authorized discharges, including upstream discharges, which presently degrade an ONRW, will be subject to alternatives analysis. Public participation for these existing discharges will be provided in conjunction with permitting activities.

An assessment of environmental, economic, and social impacts will be prepared for each stream or stream segment proposed for ~~Tier 3~~ ONRW designation. The assessment content and process will be determined by the Division of Water Pollution Control but will contain sufficient data and information to inform the Water Quality Control Board about environmental, economic, and social impact of ONRW designation. Further, the process will provide for comprehensive public participation with a solicitation of position statements from appropriate local government agencies including but not limited to county and municipal governments, Soil Conservation Districts, Utility Districts, as well as other local, state, and federal agencies that may have responsibility for land and water resource management within the watershed of the proposed stream segment.

The following streams or portions of streams are designated as ONRW:

WATERBODY	PORTION DESIGNATED AS ONRW
(a) Little River	Portion within Great Smoky Mountains National Park.
(b) Abrams Creek	Portion within Great Smoky Mountains National Park.
(c) West Prong Little Pigeon River	Portion within Great Smoky Mountains National Park.
(d) Little Pigeon River	From the headwaters within Great Smoky Mountains National Park <del>to the</del> downstream <u>to the confluence of Mill Branch boundary of Pittman Center.</u>

(Rule 1200-4-3-.06, continued)

- |     |                                 |   |
|-----|---------------------------------|---|
| (e) | Big South Fork Cumberland River | Portion within Big South Fork National River and Recreation Area. |
| (f) | Reelfoot Lake                   | Tennessee portion of the lake and its associated wetlands.        |

The portion of the Obed River that is designated as a federal wild and scenic river as of June 22, 1999 is designated as ONRW ~~tier 3~~; provided however, that if the current search for a regional water supply by the Cumberland Plateau Regional Water Authority results in a determination that it is necessary to utilize the Obed River as its source of drinking water, for that purpose the Obed shall be designated as an Exceptional Tennessee Water ~~tier 2~~ and any permit issued for that project, whether state, federal, or otherwise, shall be considered under the requirements for Exceptional Tennessee Waters. ~~tier 2~~.

- (~~56~~) All discharges of municipal sewage, industrial waste, or other wastes shall receive the greatest degree of effluent reduction which the Commissioner of the Tennessee Department of Environment and Conservation determines to be achievable through application of stringent effluent limitations and schedules of compliance either promulgated by the Water Quality Control Board; required to implement any applicable water quality standards, including where practicable, a standard permitting no discharge of pollutants; necessary to comply with a State Water Quality Plan; or necessary to comply with other State or Federal laws or regulations.
- (~~67~~) In implementing the provisions of these rules as they relate to interstate streams, the Commissioner of the Tennessee Department of Environment and Conservation and the Tennessee Water Quality Control Board will cooperate with the appropriate Federal Agency in order to assist in carrying out responsibilities under the Federal Water Pollution Control Act, as amended.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999. Amendment filed October 24, 2003; effective January 7, 2004.

**1200-4-3-.07 GROUND WATER CLASSIFICATION.**

- (1) Purpose and Intent. It is one of the primary goals of the Tennessee Water Quality Control Act, T.C.A. 69-3-101 et. seq. (the “Act”) to protect our valuable ground water resource. This rule classifies ground water across the state based on the factors stated in the Act, T.C.A. 69-3-105(a)(2) and establishes ground water quality criteria. The quality of ground water varies in Tennessee, some aquifers, or portions thereof, produce water with sufficient quality and quantity to be used by our citizens directly as a drinking water supply, other aquifers, or portions thereof, produce water in sufficient quantities to be used as a water supply but the water requires treatment before it can be used as such. Finally, some aquifers, or portions thereof, either have levels of naturally occurring constituents that make the resource unusable as a drinking water supply or the aquifer does not produce enough water to be used as a drinking water supply. The Board recognizes these rules apply to both permitting activities and response actions, as the term response is defined rule 1200-1-13-.02(1)(ff). The abatement of pollution is a goal of the Act and these rules. These rules provide appropriate flexibility in the regulatory process to protect our ground water resource. Allowing the beneficial use and/or reuse of brownfield areas for some permitted waste management activities reduces the use of greenfield areas for such purposes; which will conserve and protect our environment. However, the Site Specific Impaired classification does not apply in the context of activities involving areas with no ground water contamination. When ground water has been polluted by human activity, these rules set forth the procedures and standards for any necessary ground water remediation. In certain cases, due to site specific conditions, it may not be technologically feasible to clean up a site and/or the costs associated with such clean up or other factors may substantially outweigh the benefits of the restored resource. These rules establish a Site Specific Impaired classification that may apply in such areas after a thorough evaluation of feasibility of remediation and the potential risk of allowing contaminants to remain in ground water. The Board recognizes that several Divisions within the Department have a role in protecting ground water resources. It is not the intent of these rules to change the responsibilities of those programs. It is, however, the intent of these rules to provide a uniform basis for decisions involving ground water that may be applied by all Divisions of the Department. The Board does not intend these rules to affect in any way the ability of the State to seek natural resource damages from responsible parties when ground water has been contaminated by human activity.
- (2) The ground water of the State is classified as follows:
  - (a) Special Source Ground Waters - This is ground water with exceptional quality and quantity, which may serve as a valuable source for water supply or which is ecologically significant. Special source ground water is vulnerable to contamination. Through the rulemaking process, the Water Quality Control Board will amend this rule to include the specific area of an aquifer which receives this designation. The Board shall clearly define the horizontal and vertical boundaries of ground water designated as Special Source Ground Water. In making this decision, the Board shall consider the following factors as submitted by the applicant:
    1. The vulnerability of the aquifer, or portion thereof, to contamination due to hydrogeologic characteristics;
    2. The number of persons or the proportion of the population using the ground water as a drinking water supply;
    3. A comparison of the economic, social and environmental benefits and costs of maintaining the special source ground water with the economic, social and environmental benefits and costs of replacing the special source ground water;
    4. An evaluation of the ecological and environmental impact should the quality of the special source ground water be compromised; and
    5. Other pertinent information as deemed necessary by the petitioner or the Department.

(Rule 1200-4-3-.07, continued)

Because such action is a rulemaking procedure, public input may be made as provided in the Uniform Administrative Procedures Act, T.C.A. 4-5-201 et. seq., but not as a contested case under T.C.A. 4-5-301 et. seq.

- (b) General Use Ground Water - Except for aquifers, or portions thereof, that have been designated as Special Source Ground Water, all ground water which, as it is encountered, has naturally occurring levels of Total Dissolved Solids of 1000 parts per million or less is classified as General Use Ground Water upon certification by the Commissioner; provided the aquifer or portion of an aquifer can produce an average yield of at least one (1) gallon per minute over a twenty four (24) hour period in a properly constructed six (6) inch water well or a well of alternate construction and equivalent yield approved by the Department. The well shall have three well volumes purged before the twenty four (24) hour pump test begins. Any ground water which is used as a source of drinking water is also classified as General Use regardless of the well yield or the ground water's natural quality, unless that ground water meets the requirements for the Site Specific Impaired classification in 1200-4-3-.07(2)(d).
- (c) Limited Use Ground Water - This is ground water which is not currently a source of drinking water and is classified as Limited Use ground water upon certification by the Commissioner:
  - 1. Ground water with naturally occurring levels of Total Dissolved Solids above 1,000 ppm but less than 3,000 ppm; or
  - 2. Any aquifer or portion of an aquifer which is not capable of producing an average yield of one (1) gallon per minute over a twenty four (24) hour period in a properly constructed six (6) inch diameter water well or a well of alternate construction and equivalent yield approved by the Department. The well shall have three well volumes purged before the twenty four (24) hour pump test begins; or
  - 3. Ground water contaminated by human activity previous to November 19, 1980 if:
    - (i) there are no liable parties as defined in T.C.A., 68-212-202 (3) (B), (C), or (D); and
    - (ii) the current property owner did not cause the ground water contamination.

When ground water is encountered and certified by the Commissioner to be Limited Use as described above, the areal extent of the Limited Use ground water shall be delineated. This means the vertical and horizontal boundaries shall be established by sampling from properly constructed ground water monitoring wells, existing water wells and/or springs or by use of other appropriate means; including, but not limited to, topographical evaluations, dye traces, geologic and hydrologic modeling, etc. The horizontal boundaries of the Limited Use ground water cannot extend beyond the perimeter investigated as described above. The vertical boundaries of the Limited Use ground water can not exceed the depth of the ground water investigated as described above. Figures which clearly depict the horizontal and vertical boundaries of the Limited Use ground water must be submitted with the plans/reports required by the response action or permitting action.

Any ground water used as a drinking water source, at the time of classification, regardless of its natural quality or the aquifer yield cannot be classified as Limited Use ground water.

(Rule 1200-4-3-.07, continued)

- (d) **Site Specific Impaired Ground Water-** This is ground water that has been contaminated by human activity and it is not technologically feasible to remediate the ground water to the level required by other classifications or if the costs of such a remediation substantially outweigh the benefits of the restored resource. Ground water shall be classified as Site Specific Impaired upon certification by the Commissioner. The process used to certify ground water as Site Specific Impaired is stated in 1200-4-3-.09.
  - 1. When ground water is encountered and certified by the Commissioner to be Site Specific Impaired as described above, the areal extent of the Site Specific Impaired ground water shall be delineated. This means the vertical and horizontal boundaries shall be established by sampling from properly constructed ground water monitoring wells, existing water wells and/or springs or by use of other appropriate means; including, but not limited to, topographical evaluations, dye traces, geologic and hydrologic modeling, etc. The horizontal boundaries of the Site Specific Impaired ground water cannot extend beyond the perimeter investigated as described above. The vertical boundaries of the Site Specific Impaired ground water can not exceed the depth of the ground water investigated as described above. Figures which clearly depict the horizontal and vertical boundaries of the Site Specific Impaired ground water must be submitted to the Department in the plans/reports required by Rule 1200-4-3-.09.
- (e) **Unusable Ground Water -** The following ground water is classified as Unusable Ground Water upon certification by the Commissioner:
  - 1. Ground water that is mineral, hydrocarbon or geothermal energy producing, or can be demonstrated by a permit applicant as part of a permit application for a Class II or III operation under Chapter 1200-4-6, Underground Injection Control, to contain minerals or hydrocarbons that, considering their quality and location are expected to be commercially producible; or
  - 2. Ground water at a depth and location which makes its use as a water supply economically or technically impractical; and
  - 3. Ground water with naturally occurring total dissolved solids of more than 3,000 ppm; or
  - 4. Ground water that was contaminated by human action in connection with the specific activity referenced below which:
    - (i) is located over a Class III well mining area subject to subsidence or catastrophic collapse; or
    - (ii) has been used to receive fluids and other substances from a Class I injection well, provided the Class I well was approved by the Department on or prior to September, 1985; or
  - 5. Ground water within the area excavated during the process of mining coal or other minerals pursuant to valid permits. Ground water beyond the excavation area will be classified as it is encountered as described elsewhere in this rule. Ground water which moves from the excavated area and becomes surface water shall be regulated as described in the surface water classification and criteria in these rules.

When ground water is encountered and certified by the Commissioner to be Unusable as described above, the areal extent of the Unusable ground water shall be delineated. This means the vertical and horizontal boundaries shall be established by sampling from properly constructed ground water monitoring wells, existing water wells and/or springs

(Rule 1200-4-3-.07, continued)

or by use of other appropriate means; including, but not limited to, topographical evaluations, dye traces, geologic and hydrologic modeling, etc. The horizontal boundaries of the Unusable ground water cannot extend beyond the perimeter investigated as described above. The vertical boundaries of the Unusable ground water can not exceed the depth of the ground water investigated as described above. Figures which clearly depict the horizontal and vertical boundaries of the Unusable ground water must be submitted with the plans/reports required by the response action or permitting action. Any aquifer or portion thereof classified for the placement of fluids or other substances by underground injection on or prior to September 1985 shall retain this classification and shall not be subject to the requirements of rules 1200-4-3-.09 and .10.

- (f) After the ground water in any specific location has been classified under these rules, a rulemaking action by the Water Quality Control Board will be required to reclassify that ground water.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule filed June 28, 1999; effective September 11, 1999. Amendment filed July 13, 1999; effective October 11, 1999.

#### **1200-4-3-.08 GROUND WATER CRITERIA.**

The water quality criteria for the different classes are as follows:

- (1) Special Source Ground Water:
  - (a) except for naturally occurring levels, shall not contain constituents in excess of the concentrations listed in Table 1; and
  - (b) except for naturally occurring levels, shall not contain constituents at levels exceeding those in Rule 1200-4-3-.03 except that the criteria for fish and aquatic life and recreational use shall not apply.
- (2) General Use Ground Water:
  - (a) except for naturally occurring levels, shall not contain constituents in excess of the concentrations listed in Table 1; and
  - (b) except for naturally occurring levels, shall not contain constituents at levels exceeding those in Rule 1200-4-3-.03 except that the criteria for fish and aquatic life and recreational use shall not apply
- (3) Limited Use Ground Water:
  - (a) except for naturally occurring levels, shall not contain constituents at levels exceeding those for the use classifications in Rule 1200-4-3-.03 other than domestic water supply, fish and aquatic life and recreational use; and
  - (b) except for naturally occurring levels, in areas where historical contamination causes certain constituents to exceed the levels in rule 1200-4-3-.03, except for the criteria for domestic water supply, fish and aquatic life and recreational use, shall not contain those constituents at levels higher than those background levels; and
  - (c) shall contain no substances, whether alone or in combination with other substances, that are toxic, carcinogenic, mutagenic or teratogenic, other than those of natural origin, at levels and conditions which pose an unreasonable risk to the public health

(Rule 1200-4-3-.08, continued)

## (4) Site Specific Impaired Ground Water:

- (a) except for naturally occurring levels, shall contain no substances, whether alone or in combination with other substances, that are toxic, carcinogenic, mutagenic or teratogenic, other than those of natural origin, at levels and conditions which pose an unreasonable risk to public health or the environment;
- (b) shall contain no other constituents which pose an unreasonable risk to the public health or the environment; and
- (c) shall contain no constituents at levels that will prevent ground waters beyond the point of classification change from meeting the classification and criteria for those waters.
- (d) Site Specific Impaired Criteria shall only apply to ground water that has been certified through the process set forth in Rule 1200-4-3-.09.

## (5) Unusable Ground Water:

- (a) except for naturally occurring levels, shall contain no substances, whether alone or in combination with other substances, that are toxic, carcinogenic, mutagenic or teratogenic, other than those of natural origin, at levels and conditions which pose an unreasonable risk to the public health; and
- (b) shall contain no other constituents which pose an unreasonable risk to the public health

Table 1. Inorganic Criteria for General Use Ground Water

<u>Constituent</u>	<u>Concentration</u>
Aluminum	0.2 mg/l
Arsenic	0.05 mg/l
Asbestos	7,000,000 fibers/l
Barium	2.0 mg/l
Cadmium	0.005 mg/l
Chloride	250 mg/l
Chromium	0.1 mg/l (Total)
Copper	1.0 mg/l
Fluoride	4.0 mg/l
Iron	10.0 mg/l
Lead	0.05 mg/l
Manganese	0.5 mg/l
Mercury	0.002 mg/l
Nitrate	10.0 mg/l as Nitrogen
Nitrite	1.0 mg/l as Nitrogen
Total Nitrate & Nitrite	10.0 mg/l (as Nitrate)
Selenium	0.05 mg/l
Silver	0.1 mg/l
Sulfate	500 mg/l
TDS	1000 mg/l
(Total Dissolved Solids)	
Zinc	5.0 mg/l



(Rule 1200-4-3-.08, continued)

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule filed June 28, 1999; effective September 11, 1999. Amendment filed July 13, 1999; effective October 11, 1999.

**1200-4-3-.09 SITE SPECIFIC IMPAIRED CLASSIFICATION APPLICATION PROCESS.**

- (1) Any person who encounters ground water that may meet the requirements for Site Specific Impaired, may apply for the ground water at the site to be certified by the Department as meeting those requirements, using the process set forth in this rule. Any costs involved in making the application shall be borne by the applicant. The application shall include the following, unless it is determined by the Department in writing that the site conditions render any of them unnecessary:
  - (a) An assessment of the horizontal and vertical extent of the contamination;
  - (b) An evaluation of the hydrogeology of the area including but not limited to the ground water flow rate and direction, permeability, recharge area, ground water classification and location of local water wells, springs and seeps;
  - (c) An evaluation of the area geology including but not limited to soil type, soil permeability, soil porosity, depth to bedrock, identification of geologic formations;
  - (d) A description of the corrective actions or response actions taken or proposed;
  - (e) The chemical characteristics of the constituents(s) including but not limited to the constituent's solubility, mobility, toxicity, and carcinogenicity, the nature of and the level of constituents to remain or be present in the ground water as well as the calculations and rationale used in the determination;
  - (f) a feasibility study which evaluates clean-up alternatives, the cost, and the time to complete each alternative;
  - (g) An evaluation of current and future ground water use within a (1/2) one-half mile radius of the contaminant plume; in karst areas the impact of conduit flow shall be evaluated;
  - (h) An evaluation of current and future land uses within a (1/2) one-half mile radius of the contaminant plume;
  - (i) An evaluation of the potential of the constituent to migrate through soil and ground water to:
    1. homes;
    2. buildings;
    3. surface waters;
    4. subsurface utilities; and
    5. adjacent properties;
  - (j) A description of any existing or proposed monitoring program to observe constituent levels in soil and ground water;
  - (k) Evaluation of the existing or anticipated actual exposure pathways (inhalation, ingestion, dermal contact, etc.) of the constituents and an assessment of the human health risks presented by exposure to the constituents as well as the impact, if any, of the constituents on fish and aquatic life pursuant to 1200-4-3;

(Rule 1200-4-3-.09, continued)

- (l) Consideration of the classification in Rule 1200-4-3-.07 that would apply to the ground water at the site if it were not contaminated.
  - (m) Analysis of the technological feasibility of cleaning up the ground water to the level necessary for the criteria that would apply to the ground water at the site if it were not contaminated and a comparison of the costs of investigation and cleanup and/or any other relevant factors with the benefits of the restored resource;
  - (n) A description of how and when the contamination occurred, if known; and
  - (o) Other items as requested by the Department associated with the evaluation of the application to certify ground water as Site Specific Impaired.
- (2) The Department will issue a public notice, unless a process for public notice and input is required by other applicable regulations (in such case that regulation will be followed), when an application to certify ground water as Site Specific Impaired has been reviewed and a tentative decision to approve it has been made. The Department will conduct a public hearing concerning the application if the issue generates substantial public interest. The Department will explain the reasons it is proposing to certify the ground water as meeting the requirements for the Site Specific Impaired classification and will consider all written and oral comments received.
- (3) In the evaluation of an application to certify ground water as Site Specific Impaired, the Commissioner or this Board shall consider:
- (a) the extent of any threat to human health or safety;
  - (b) the extent of damage to the environment;
  - (c) technology commercially available to accomplish restoration;
  - (d) a comparison of the environmental and economic costs and benefits to be derived from ground water quality restoration with the environmental and economic costs and benefits to be derived from classification as Site Specific Impaired;
  - (e) the point of classification change;
  - (f) other appropriate information presented in the application.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule filed June 28, 1999; effective September 11, 1999. Amendment filed July 13, 1999; effective October 11, 1999.

#### **1200-4-3-.10 POINT OF CLASSIFICATION CHANGE.**

- (1) “Point of Classification Change” shall mean the boundary location(s) within the relevant zone of an aquifer between the portion of the aquifer that is classified as Site Specific Impaired and any other classification. Compliance with the applicable criteria at this point shall be determined using sampling data, ground water modeling or other allowable mechanisms.
- (2) All areas with ground water classified as Site Specific Impaired must be owned or controlled by the person(s) subject to ground water cleanup or permitting obligations and/or subject to appropriate deed restrictions or other institutional controls. All locations outside the point of classification change must not exceed the applicable ground water criteria beyond the point of classification change.

(Rule 1200-4-3-.10, continued)

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule filed June 28, 1999; effective September 11, 1999. Amendment filed July 13, 1999; effective October 11, 1999.

#### **1200-4-3-.11 APPEALS.**

- (1) Any applicant aggrieved by the actions of the Department in applying Rules 1200-4-3-.07 through 1200-4-3-.10 may petition this Board for a hearing provided a written petition is submitted to and received by the Commissioner;
  - (a) within thirty (30) days of certification of ground water or disapproval of an application for certification of ground water.; or
  - (b) within thirty (30) days following the expiration of the one hundred and twenty (120) calendar days from receipt of an application for certification of ground water as Site Specific Impaired if the Department has not made written request for additional information.
- (2) The Commissioner's determination shall be final and not subject to review unless the written petition for hearing is submitted and received within this time frame. The written petition must set forth the basis for the appeal as required by the Administrative Procedures Act, T.C.A. Section 4-5-101 et. seq., and the rules promulgated thereunder, particularly Rule 1360-4-1-.05.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule filed June 28, 1999; effective September 11, 1999. Amendment filed July 13, 1999; effective October 11, 1999.

(Rule 1200-4-3-.10, continued)

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Signature of the agency officer or officers directly responsible for proposing and/or drafting these rules:

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Mr. John McClurkan, Board Member

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Dr. Robert Taylor, Board Member

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Ms. Ann Murray, Board Member

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Mr. Larry Clark, Board Member

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Mr. James Haynes, Board Member

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Mr. Sidney Johnson, Board Member

---

Ms. Jill Davis, Board Member

---

Mr. Frank McGinley, Board Member

---

Mr. Eddie Wayne Floyd, Board Member

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Mr. Bob Wormsley, Board Member

The roll-call vote by the Water Quality Control Board on these rulemaking hearing rules was as follows:

	<u>Aye</u>	<u>No</u>	<u>Abstain</u>
Mr. John McClurkan	_____	_____	_____
Dr. Robert Taylor	_____	_____	_____
Ms. Ann Murray	_____	_____	_____
Mr. Larry Clark	_____	_____	_____
Mr. James Haynes	_____	_____	_____
Mr. Sidney Johnson	_____	_____	_____
Ms. Jill Davis	_____	_____	_____
Mr. Frank McGinley	_____	_____	_____
Mr. Eddie Wayne Floyd	_____	_____	_____
Mr. Bob Wormsley	_____	_____	_____

(Rule 1200-4-3-.10, continued)

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I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Water Quality Control Board on the 22nd day of July, 2003.

Further, I certify that these rules are properly presented for filing, a notice of rulemaking hearing having been filed in the Department of State on the 31st day of January, 2003, and such notice of rulemaking hearing having been published in the February 15, 2003 issue of the Tennessee Administrative Register, and such rulemaking hearings having been conducted pursuant thereto on the 17th, 18th, 24th, 25th, 27th, and 31st days of March, 2003 and the 1st and 3rd days of April, 2003.

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Chairperson, Tennessee Water Quality Control Board

Subscribed and sworn to before me this the \_\_\_\_\_ day of \_\_\_\_\_, 200\_\_\_\_.

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Notary Public

My commission expires on the \_\_\_\_\_ day of \_\_\_\_\_, 200\_\_\_\_.

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

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PAUL G. SUMMERS  
Attorney General and Reporter of the State of Tennessee

The rulemaking hearing rules set out herein were properly filed in the Department of State on the \_\_\_\_\_ day of \_\_\_\_\_, 200\_\_\_\_and will become effective on the \_\_\_\_\_ day of \_\_\_\_\_, 200\_\_\_\_.

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RILEY C. DARNELL  
Secretary of State of the State of Tennessee

By:\_\_\_\_\_

(Rule 1200-4-3-.10, continued)